Huge Media Vault - Max

(Single Channel)

User's Guide

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Thank You

Congratulations and thank you for purchasing the Huge Media Vault product from Huge Systems Inc. a leader in huge performance, huge quality, and huge cost savings storage product for your video editing and storage requirements.

Your Huge Media Vault storage system utilizes the latest SCSI Ultra160 technology. SCSI Ultra160 affords system operations at blazing speeds, enabling you to maximize valuable system time and the highest of video quality for HDTV resolutions.

Each Huge Media Vault - DualMax contains two independent RAID controllers and ten disk drives for HDTV applications. Huge Media Vault uses the latest in high performance disk drives and the latest transfer mode, huge throughput per disk drive pumping data into our RTR (Real Time RAID) engine for fault tolerant and maximum transfer rates, coupled with the RTC (Real Time Cache) at an internal data rate of 400MBytes/sec, this translates to a huge performance at the SCSI interface. Upward of 320MBytes/sec burst and 200MBytes/sec of sustained data rate with the dual SCSI channel Huge Media Vault.

Data protection are available with the built-in RAID 3@2k and RAID 3 modes. A simple and easy to use Mode Select switch selects either RAID 0 or RAID 3@2k or RAID 3 operation.

If you have any comments, suggestions or questions, please call, FAX or e-mail us. We value input from the most important people, you our customer.

Again, we thank you.

Model Numbering

The Huge Media Vault model numbers are in the following pattern:

HMV - (size) - (channels)

Where HMV is Huge Media Vault

(size) is the capacity of the Media Vault in Gigabytes in RAID 0 mode.

(channels) is either DualMax for 2 SCSI channels or Max for a single SCSI channel.

HMV-2500-DM would represent 2500 Gigabytes (2.5 Terabytes) of Dual SCSI Channel.

Features and benefits

- Max Burst Data Rate 160MBytes/sec
- Minimum Sustained Data Rate 100MBytes/sec
- One Ultra160 SCSI channel
- One RAID controller
- RAID 0 or RAID 3@2k or RAID 3
- RTR - Real Time RAID reconstructs data "on the fly" should a drive "glitch"
- RTC - Real Time Cache recognizes small block accesses for perfect audio play back.
- Ultra160 SCSI interface. Compatible with Ultra 2/LVD, Single Ended, Ultra Wide, Fast, SCSI-3, SCSI-2, SCSI interface and protocol.
- Daisy chain of multiple SCSI devices with the built-in in and out SCSI connectors.
- Five high performance hard disk drives.
- Multiple cooling fans.
- Easy user selection of functionality via Mode Selection and Mode Enable switches. No complicated software setup or maintenance.
- Serial port for detail level maintenance and support.
- Audible Alarm and LED indicators.

Agency Approvals

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

EC Declaration of Conformity:

Conforms to Standards	EN 50081-1:1992
	EN 55022: 1998

Specifications

Physical Dimensions:	7 ½" wide x 11" high x 17 ¼" deep
Weight:	26 lbs
Power:	Selectable 100-120 VAC 60 Hz or 200-240 VAC 50 Hz
Current Draw:	115VAC Start-up 1.0 A
	Read/Write/Seek: 0.4 A
	200 W maximum
Operating temperature:	5-40 degrees Celsius

Technical Support

World Wide Web: www.hugesystems.com	e-mail: support@hugesystems.com
Telephone: 818-991-1188 M-F: 8AM – 5PM PST.	FAX: 818-991-6893

Serviceability

There are no user serviceable parts in the Huge Media Vault storage subsystem. Designed simply for maximum reliability with NO requirement for any type of scheduled maintenance.

Getting Started

The Huge Media Vault comes pre-assembled and ready to be connected to the SCSI Ultra160 compatible SCSI interfaces of your video edit computer equipment right out of the box.

Unpacking

- Remove all components from the shipping container. Retain all boxes and packing materials in case you might need to reuse them later.
- Examine the components for shipping damage. Contact the freight carrier immediately if damage exists.

Check List

- Huge Media Vault – Single Controller External Disk Array.
- One SCSI Ultra160/LVD/SE dual mode terminator.
- SCSI Ultra160 compatible interface cable.
- AC power cord.
- Diagnostic cable.
- This Users Guide.

Editing System Requirements

- Ultra160 or compatible SCSI host adapters
- Windows 9x/NT/ME/2000,XP, Mac OS, IRIX, Linux
- Video Capture card
- Video Editing software
- Video player or other source of video input

Hardware Installation and configuration

SCSI Host Adapter

Recommended SCSI Host Adapters

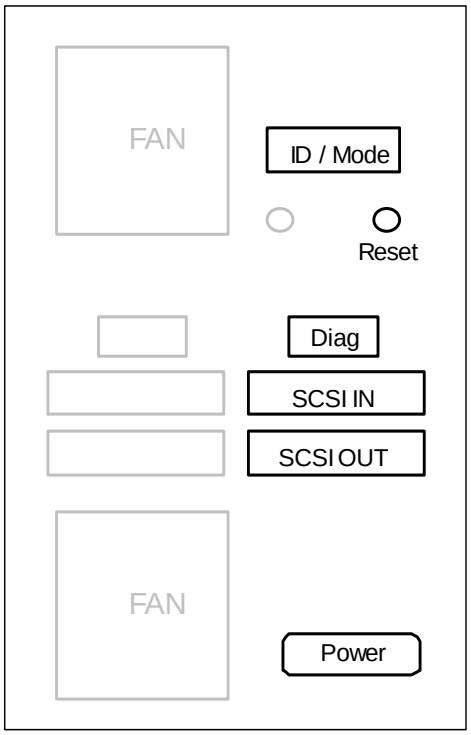
	Apple G4	Apple G5	Intel & Compatibles
Dual Channel	ATTO UL3D-000 (33 Mhz)	ATTO UL3D-66 (66 Mhz)	ATTO UL3D-000 ATTO UL3D-66 Adaptec 39160
Single Channel	ATTO UL3S-000 (33 Mhz)	ATTO UL3S-66 (66 Mhz)	ATTO UL3S-000 ATTO UL3S-66 Adaptec 29160

The Huge Media Vault communicates with your computer using the industry standard SCSI Ultra160 interface. You must have a compatible SCSI Host Adapter installed in your computer to work with the Huge Media Vault storage system. Some computers have a built-in native SCSI port, check your computer for availability.

To maximize the Huge Media Vault Ultra160 interface, the SCSI Host Adapter in your computer should also be rated for Ultra160. However, the slower Ultra2 and Ultra Wide SCSI rated host adapters will work but at a lower transfer rate.

Check to make sure the Host Adapter is physically installed correctly and the appropriate Host Adapter drivers are loaded and functioning properly before connecting the Huge Media Vault to your computer system.

Component Locations



SCSI ID

The SCSI ID selection switches are located in the rear of the unit.

Not used		**SCSI ID**	Mode Select
		0 to 15	

Each SCSI device attached to a SCSI channel must have it's own unique ID setting. Valid ID for Wide SCSI are from 0 to 15. Most SCSI host adapters inside your computer typically occupies ID 7. If there are other SCSI devices on the SCSI channel, ensure that there are no SCSI ID conflicts.

If you are unsure which ID to use and the Huge Media Vault is the only device attached to this particular channel of the host adapter, ID 0 can be used.

The Huge Media Vault must be turned off and back on again to make a new SCSI ID setting take effect.

Mode Select – RAID Level

The Mode Select switch is located in the rear of the unit.

Not used		SCSI ID	**Mode Select**
			0 to 7

Mode Select is a unique feature of Huge Systems and it is a convenient way to select the desired operating mode of the unit. No need of complicated software and serial port configuration procedures.

IMPORTANT: Changing the Mode can cause any existing data to be over written. Make sure any data you want to keep is stored elsewhere before making any changes.

Remove or delete any known partitions before changing the mode, this will keep the OS from getting confuse due to left over file systems information left on the MediaVault.

Consult the RAID Compatibility table in the Application Notes section to ensure proper operation.

Mode	*Mode Select	Effect	Additional information	Pro	Con
RAID 0	0	Striped data	Data striped across all five drives of the RAID controller. Usable storage is the sum of all five drives.	Maximum Speed	No Drive Redundancy
RAID 3@2k	1	2K bytes sector size Striped data with redundancy.	Block size is based on 2048 bytes. Data striped across four drives plus one drive for redundant information. Usable storage is the sum of four drives.	Drive Redundancy	Medium Speed
RAID 3	2	512 bytes sector size Striped data with redundancy.	Block size is based on standard 512 bytes. Data striped across four drives plus one drive for redundant information. Usable storage is the sum of four drives. Use this mode if you are not certain which of the two RAID 3 to use.	Drive Redundancy	Minimum Speed
Manufacturing Test	7	System verification test	This mode will over write data on the Huge Media Vault as the diagnostic will perform read and write tests on every drive and on every block of data. The unit records vital parameters of each disk drive's performance, and it can be retrieved using the Diagnostic Port for further analysis.		

*Make sure to "Double Beep" to set the mode.

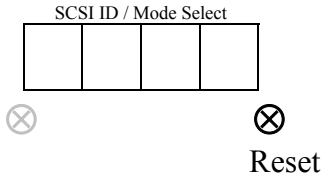
Double Beep

As a precautionary measure to protect from un-intentional mode changes. A combination of holding down the Reset Button and turning the unit on must be performed to cause the change.

1) Determine the Mode desired and note the Mode Select value.
2) Set the value on the Mode Select switch. Use a pointed instrument and press the tiny button above or below the number window.
3) Turn off the Huge Media Vault unit.
4) Press and hold the Reset Button.
5) Apply power to the unit.
6) Within about 15 seconds you will hear two beeps to confirm the change.
7) Release the Reset Button

Reset Button

The Reset Buttons are located below the SCSI ID and Mode Select switch quadrant.



The Reset Button is used in conjunction with the Mode Select option. See the Mode Select section.

SCSI connections

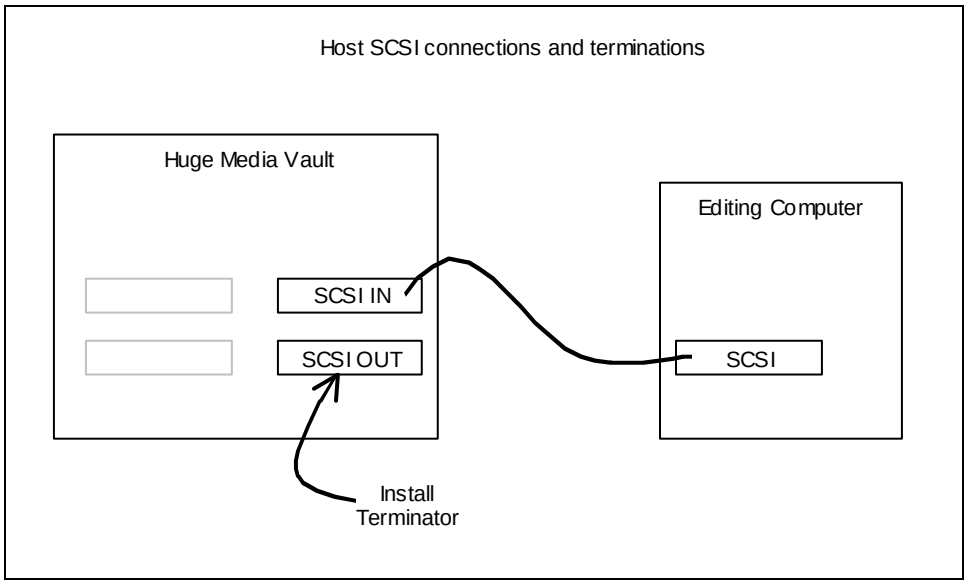
The Huge Media Vault have a pair of SCSI 68-pin high density connectors. They function as an IN and an OUT connection with internal loop-through for the SCSI channel. This SCSI channel is compatible with Ultra160 (LVD – Low Voltage Differential) at 160 MBytes/sec, Ultra2 (LVD) at 80MBytes/sec, and other SCSI standards. HVD (High Voltage Differential) is not supported.

Host connections

Use a Ultra160 rated SCSI cable to connect the SCSI channel to your host computer. Connect the SCSI IN of the Huge Media Vault to the SCSI channel in the computer.

Terminator

Use a Ultra160 rated SCSI terminator to terminate the SCSI connection. Connect the terminator to SCSI OUT.

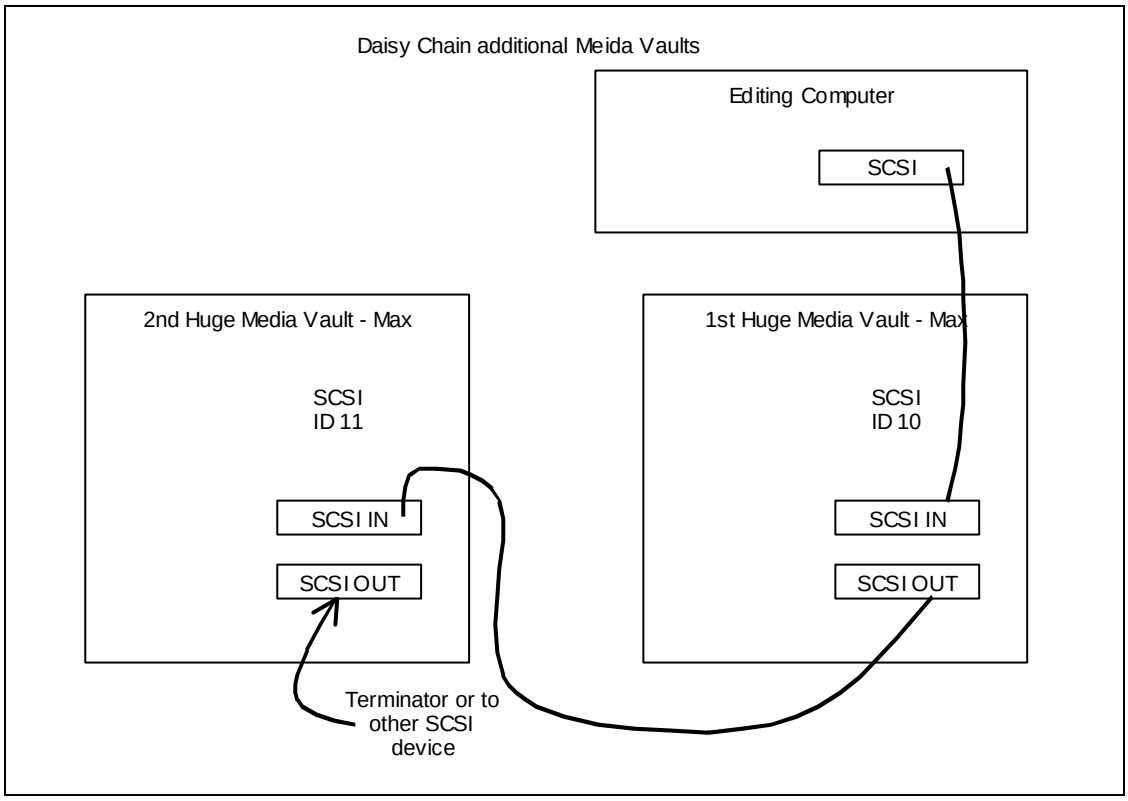


Daisy chaining

If you have multiple SCSI devices to connect up, you can connect (daisy chain) other SCSI devices as shown. At the back of the Huge Media Vault you will have at the SCSI IN connector a SCSI cable connected to your host computer, and at the SCSI OUT connector a SCSI cable connected to your other SCSI device.

Keep in mind that all connected SCSI devices must be rated at and configured to run at Ultra160 for maximum data transfer, mixing slower devices such as Ultra2, Ultra Wide, narrow SCSI, etc… will reduce the data transfer rate to the slowest device on the SCSI channel.

Please ensure that 1) the total SCSI cable length are kept as short as possible (Maximum 12 meters); 2) remember to use a terminator at the end device of each SCSI chain; 3) No duplicated or SCSI ID conflict on any particular SCSI channel.



Input Power

AC Power

Check the proper voltage input setting for your local AC power source, switch is located at the rear of the Media Vault. Set it to 115VAC or 230VAC. Attach the supplied AC power cord to the Huge Media Vault at the rear and to an AC power source.

Power Switch

The power switch for the Huge Media Vault is located at the lower front right of the unit. Turn on the Huge Media Vault by pressing the front power switch. To turn off the unit, press the power switch again.

Turn on the Hug Media Vault first, then your computer, the unit is ready for operation within a few seconds.

Indicators

Front LED Status Indicators

Huge Media Vault status indicators are located at the lower front of the unit.

☼ OK	☼ U160	☼ Not used	☼ Not used	☼ Power
On = RAID is OK. Off=Busy	On=SCSI running at U160 speed. Off=SCSI less than U160 speed.			On=power applied. Off=No AC power.

OK is on, indicates that the RAID is functioning normally.

OK is blinking, indicates that the RAID is busy servicing commands.

OK is flashing a steady code. When there is no access to the Media Vault and OK is flashing a steady code, it indicates that particular drive is down.

U160 is on, indicates that the SCSI channel is operating at full Ultra160 speed.

U160 is off, indicates that the SCSI channel is operating at lower than optimal Ultra160 speed. This condition are normally associated with terminators, host adapter configurations, or additional attached SCSI devices on this particular channel.

Power Up Light Show

A quick way to validate normal functional power up sequence of the Huge Media Vault is by a combination of beep and LED flashes.

1) Short chirp
2) OK LEDs slow flash
3) A short pause
4) OK LEDs rapid flash
5) OK LEDs on solid

Immediately after application of power, a quick and short chirp (beep) should be heard. The OK indicators starts a flashing sequence as outlined above. The unit should be ready for operation within 20 seconds of power on.

If a beeping (Audible Alarm) code is heard, there is a problem. See the Audible Alarm section.

Diagnostic Port

A serial Diagnostic Port cable is supplied to enable future firmware download and any special diagnostic requirements. Under normal operating circumstance there is no need to hookup the serial port.

Should you have any need to journey into the Diagnostic Port, please call our Technical Support Department and they will be happy to assist you.

Audible Alarm

The Huge Media Vault will sound an alarm if there is a problem with the RAID operation. Corrective actions can be applied to rectify the problem.

6 Rapid Beeps During Boot Time

6 rapid beeps during boot time is normally associated with SCSI cabling, SCSI termination, or power up sequence related. Always turn on the MediaVault on first, then turn on the computer. You might need to physically remove and re-insert the SCSI connectors along the SCSI path, this includes the connectors at the SCSI controller, at the MediaVault and the terminators.

Check to ensure there are no other SCSI devices on the bus using the same SCSI ID address.

Try removing any other SCSI devices that shares the same SCSI bus as the Media Vault, leaving just the Media Vault as the only SCSI device will help to identify if there is a conflict with other devices.

6 Rapid Beeps During Normal Operation

6 rapid beeps during normal operation indicates either there is a SCSI interface issue or a disk drive in the MediaVault has timed out. Check to ensure all SCSI connections are securely in place, you might need to physically remove and re-insert the SCSI connectors along the SCSI path, this includes the connectors at the SCSI controller, at the MediaVault and the terminators.

Slow Beeps

One or more slower beep indicate a bad drive or an intermittent drive, the number of beeps indicates which drive is having problems. When operating in RAID 3@2K or RAID 3 mode the Huge Media Vault is still available for normal operation without performance degradation, but the beeps indicate that a drive is down and you are running without RAID 3 protection. Should another drive fail, your are in danger of loosing data.

Formatting and Partitioning

Formatting and Partitioning of the Media Vault is required to prepare the unit for usage. After the unit is physically connected to your computer, use the following sections as a guide to locate and execute the appropriate utility to format and partition the Media Vault.

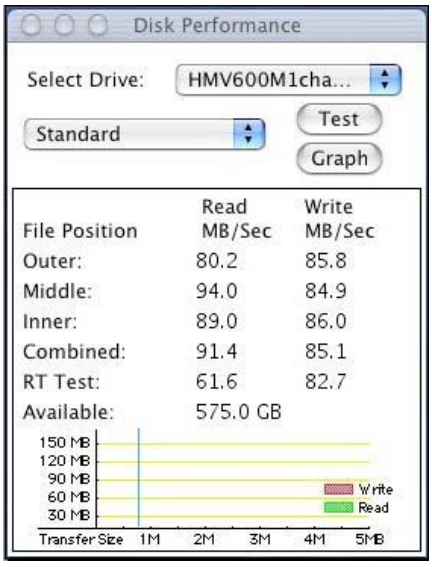
The Huge Media Vault is seen as two large SCSI disk drives by the SCSI host adapter in your computer. Install the appropriate driver for your SCSI Host Adapter. No additional software or drivers are necessary to use the Huge Media Vault. Treat the Huge Media Vault as a pair of normal ordinary hard disk drives when partitioning and formatting.

Macintosh G4 / G5 in OS X

Use the following configuration to get maximum speed from a MediaVault DualMax with OS 10, ATTO UL3D, for video capturing/playback and editing.

Check and ensure you are using the latest recommended configuration for your capture card and editing software, update any software or drivers as necessary.

Following the "Bart Process" described below will provided maximum data rate for your editing system.



HMV-600-M RAID 0 performance with Pinnacle's Cinewave benchmark on a G4.

1) Use ATTO ExpressStripe to initialize the MediaVault (Fig. 1 through 6)

   Start ExpressStripe > Delete > Initialize > Select the HUGE drive > Next > Drive(s) Verified > Ok.

2) Use Apple's Disk Utility to stripe. (Fig. 7 through 9)

   Start Disk Utility > Partition Tab >Partition Button > Partition Button (again).

3) Remove ATTO's ExpressPCI Configuration Tool. If installed, run the un-install to remove it.

   The un-install is normally at Macintosh HD > Applications > ExpressPCI Configuration Tool > Uninstaller Data > Uninstall ExpressStripe.

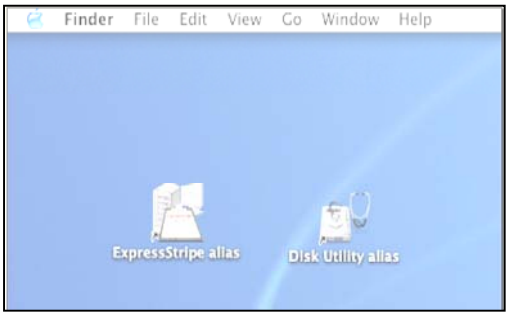


Fig. 1 Apple's OS X Desktop show. Launch the ATTO ExpressStripe Software. The software is typically installed on your Macintosh HD > Applications folder.

ExpressStripe is an optional software application from ATTO Technology, if you don't have it, you can skip to Fig. 7 but your performance may not be optimal.

ATTO ExpressStripe for Mac OS X version 2.0
Welcome to ExpressStripe for Mac OS X
ATTO
Use this program to manage RAID and standard volumes.
Create
Create a standard or striped drive volume(s).
Delete
Delete a volume or initialize a drive.
Utilities
Useful tools for your system.

Fig. 2 Select the ***Delete*** option from the menu.

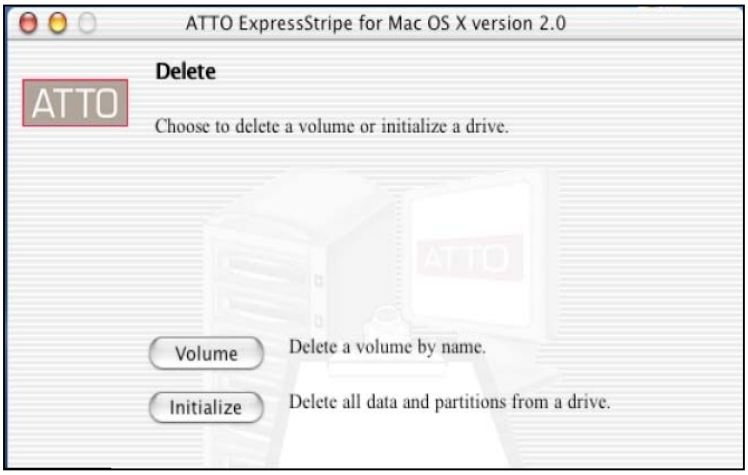

ATTO ExpressStripe for Mac OS X version 2.0
Delete
ATTO
Choose to delete a volume or initialize a drive.
Volume
Delete a volume by name.
Initialize
Delete all data and partitions from a drive.

Fig. 3 Select the ***Initialize*** option from the menu

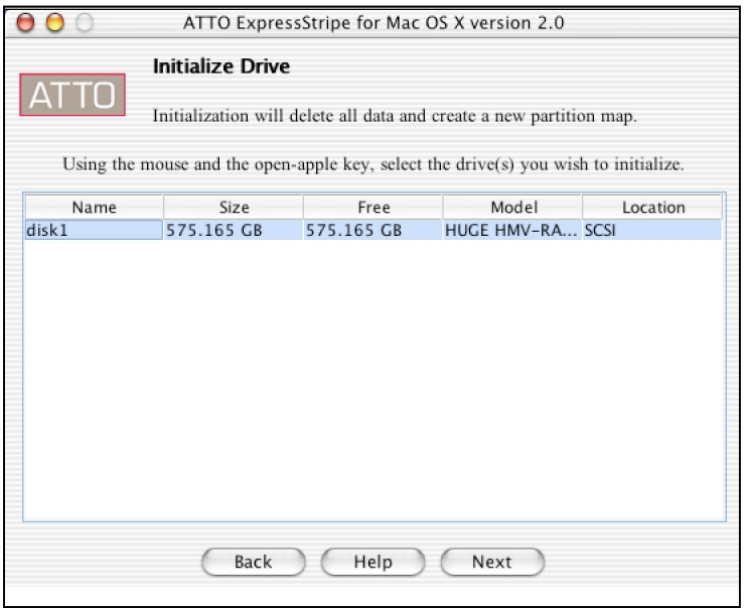


Fig. 4 Highlight the Huge disk click ***Next.***

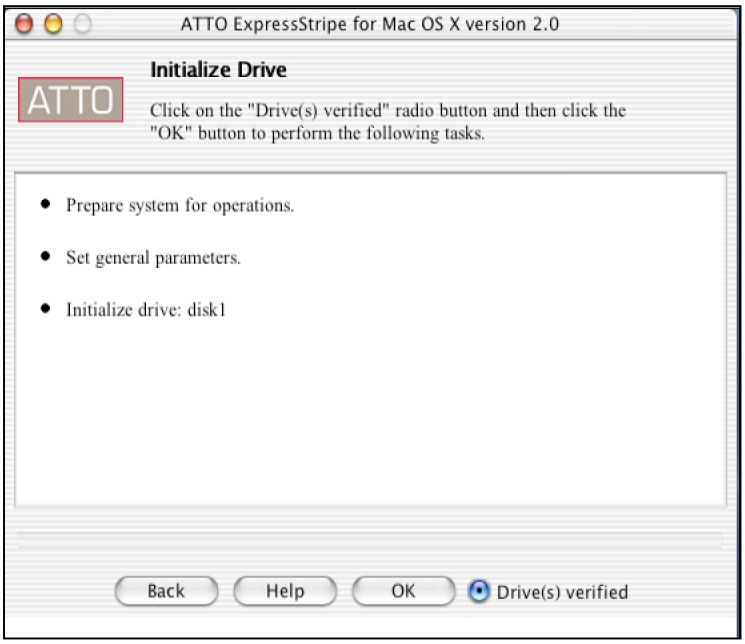

ATTO ExpressStripe for Mac OS X version 2.0
ATTO
Initialize Drive
Click on the "Drive(s) verified" radio button and then click the "OK" button to perform the following tasks.
Prepare system for operations.
Set general parameters.
Initialize drive: disk1
Back
Help
OK
Drive(s) verified

Fig. 5 Select the ***Drives verified*** bubble and click ***OK.***

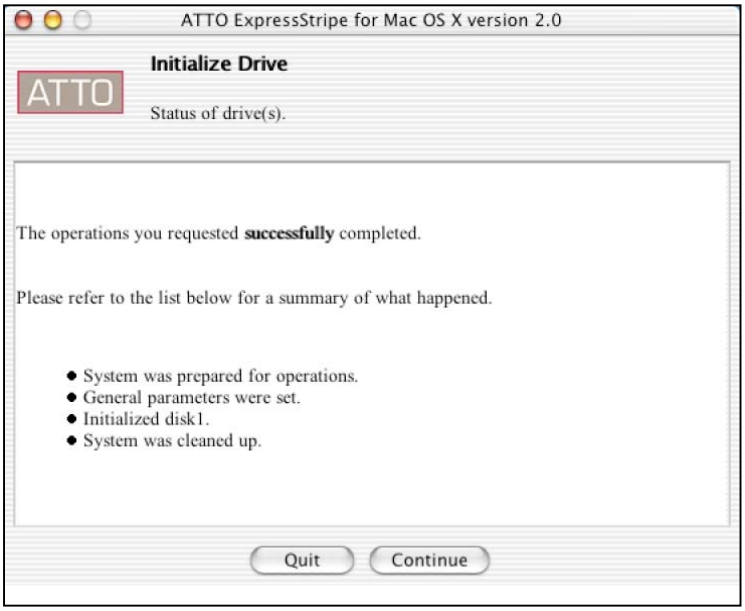

ATTO ExpressStripe for Mac OS X version 2.0
ATTO
Initialize Drive
Status of drive(s).
The operations you requested successfully completed.
Please refer to the list below for a summary of what happened.
System was prepared for operations.
General parameters were set.
Initialized disk1.
System was cleaned up.
Quit
Continue

Fig. 6 After drive initialization, select ***Quit*** to exit out of the software.

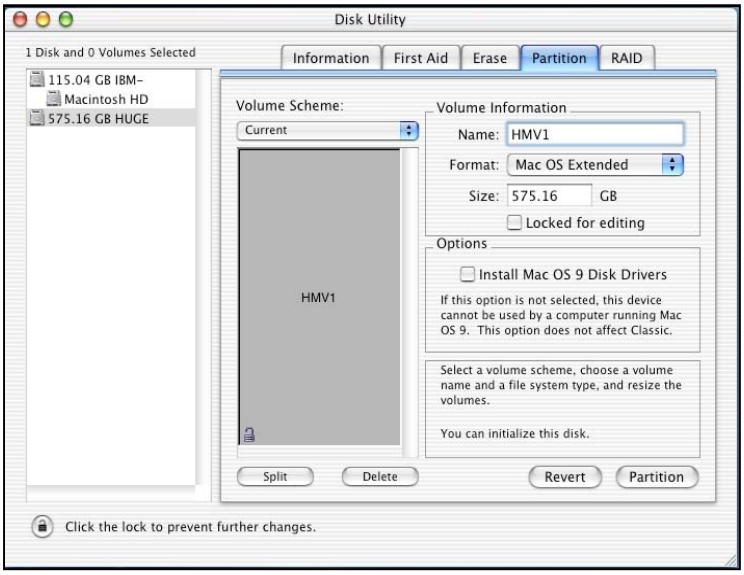


Fig. 7 Launch the Apple Disk Utility software and select the ***"Partition"*** tab. Highlight your Huge drive on the left. Give your volume a name, select the format as Mac OS Extended and **Un**check the option to install Mac OS 9 Disk Drivers. Click on the ***"Partition"*** button to proceed.Disk

Utility is located at Macintosh HD > Applications > Utilities.

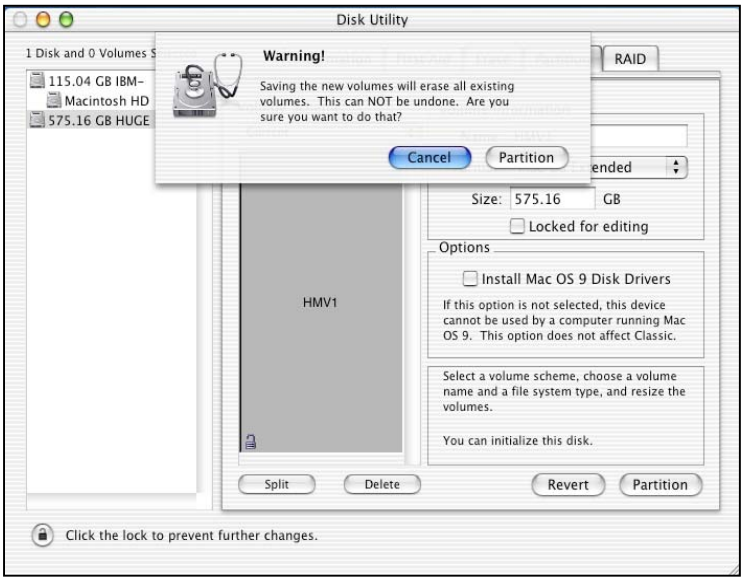

Disk Utility
Warning!
Saving the new volumes will erase all existing volumes. This can NOT be undone. Are you sure you want to do that?
Cancel
Partition
115.04 GB IBM-
Macintosh HD
575.16 GB HUGE
RAID
Size: 575.16 GB
Locked for editing
Options
Install Mac OS 9 Disk Drivers
If this option is not selected, this device cannot be used by a computer running Mac OS 9. This option does not affect Classic.
HMV1
Select a volume scheme, choose a volume name and a file system type, and resize the volumes.
You can initialize this disk.
Split
Delete
Revert
Partition
Click the lock to prevent further changes.

Fig. 8 You will be given a warning. To proceed click the ***"Partition"*** button.

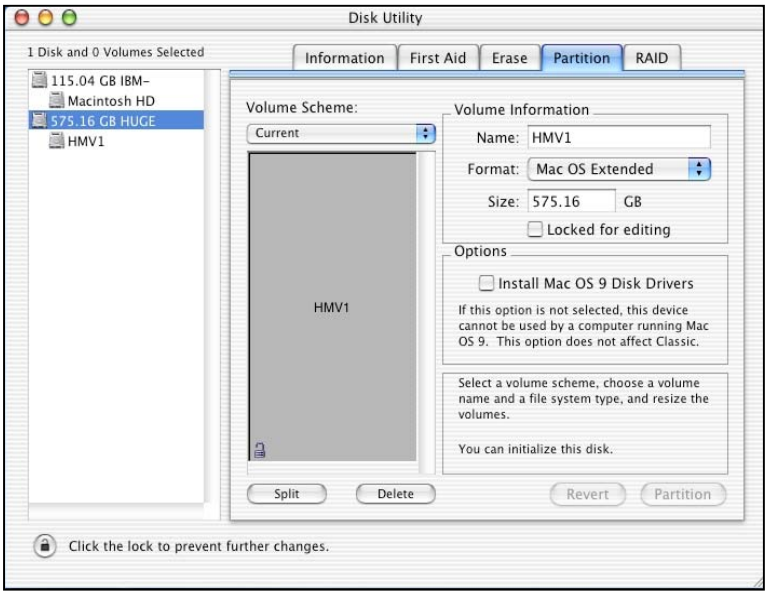


Fig. 9 You should now see your named volume as show on the left hand side of the screen. Congratulations! You have successfully prepared your disks utilizing the “Bart Process”.

Windows NT Partition / Format

Windows NT provides a utility to partition and format disks. Locate and start the Disk Administration program by clicking:

Start > Program > Administrative Tools > Disk Administrator.

Each channel of the Media Vault should appear as a disk entry with “Free Space”.

Preparing a Media Vault Max (single channel)

Right click on the “Free Space”, left click on Create, confirm the size of the partition you desire, click OK. Click Yes to confirm partition creation.

The changes must be committed before going further, right click on the “Unformatted” section of the disk and click on “Commit Changes Now”. Click Yes to save the changes. Click OK to confirm “Disks were updated successfully”.

After the partition is created, it must be formatted. Right click on the “Unknown” section of the disk and click Format. Change the File System to NTFS, change the Volume Label as desire, check the Quick Format box, and leaving the other selections as they are. Click Start > OK to begin the formatting operation.

A progress meter will show the progress, at completion a confirmation dialog box will appear, click OK > Close. Note the newly prepared disk will have a drive letter associated with it. Exit program if done.

Preparing a Media Vault DualMax (dual channel)

Select the disks you which to stripe together by Left click on the first disk with “Free Space”, then press Control and left click on the second disk with “Free Space”. Right click on either one of the selected “Free Space”, left click on Create Stripe Set, confirm the size of the partition you desire, click OK.

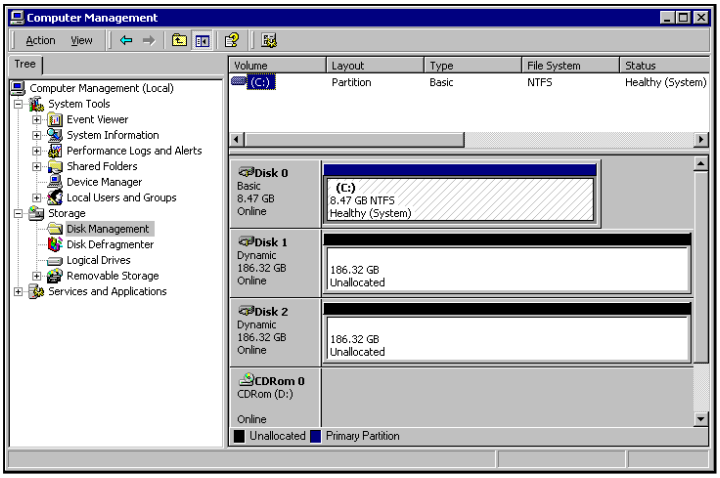
The changes must be committed before going further, right click on the “Unformatted” section of one of the disk and click on “Commit Changes Now”. Click Yes to save the changes. Click OK to confirm “Disks were updated successfully”.

After the partition is created, it must be formatted. Right click on the “Unknown” section of one of the disk and click Format. Change the File System to NTFS, change the Volume Label as desire, check the Quick Format box, and leaving the other selections as they are. Click Start > OK to begin the formatting operation.

A progress meter will show the progress, at completion a confirmation dialog box will appear, click OK > Close. Note the newly prepared disks will have a drive letter associated with it. Exit program if done.

Windows 2000 and XP Partition / Format

Windows 2000 and XP provides a utility to partition and format disks. Locate and start the Disk Management program by clicking:



Start > Settings > Control Panel > Administration Tools > Computer Management > under the Computer Management tree Storage > Disk Management.

A Write Signature dialog will open if fresh disks are detected, click Next, and check the new disk(s) > Next > Finish.

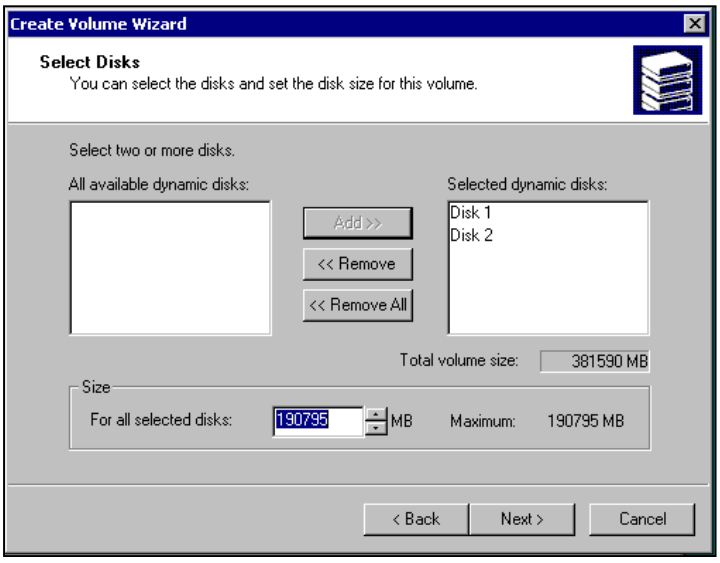
Each channel of the Media Vault should appear as a disk entry with "unallocated".

Preparing a Media Vault Max (single channel)

Right click on "Unallocated", left click on Create Volume > Next > Simple volume > Next > confirm the desired disk is in the Selected dynamic disks box > Next > confirm the desired Drive Letter > Next > check the Perform a Quick Format box > Next > Finish.

Formatting starts and will take a minute or so. At the completion of format, note the newly prepared disks will have a drive letter associated with it. Exit program if done.

Preparing a Media Vault DualMax (dual channel)

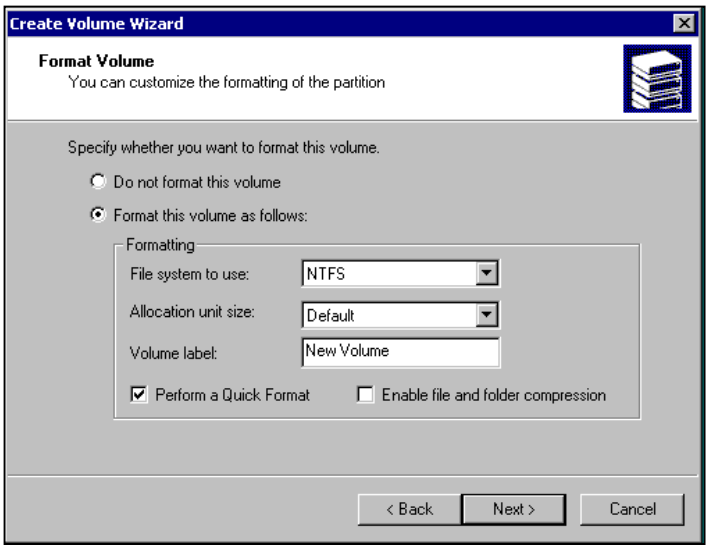


Right click on "Unallocated", left click on Create Volume > Next.

Select Striped volume > Next.

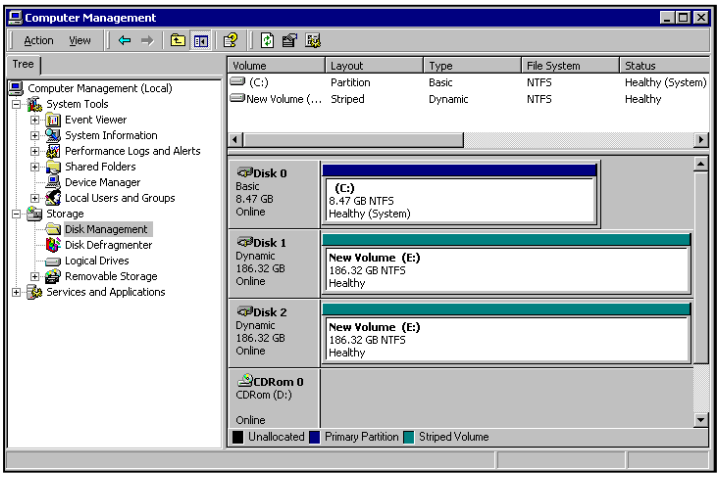
Highlight the available dynamic disk you which to add to the stripe click Add > Next.

Confirm the desired Drive Letter > Next.



Check the Perform a Quick Format box > Next.

Formatting starts and will take a minute or so.



At the completion of format, note the newly prepared disks will have a drive letter associated with it.

Exit program if done.

Application Notes

General

Video Resolution Data Rates

Video Resolution	Data Rate Megabytes / Sec
DV/DV25	3.7
DV50	7.4
SD 8 bit	20
SD 10 bit	27
HD 1080i 8 bit	120
HD 1080i 10 bit	155
HD 720 8 bit	110
HD 720 10 bit	138

Hours per Terabyte Table

Video Resolution	Hour per Terabyte (1000Gigabyte)
DV/DV25	75.1
DV50	37.5
SD 8 bit	13.9
SD 10 bit	10.3
HD 1080i 8 bit	2.3
HD 1080i 10 bit	1.8
HD 720 8 bit	2.5
HD 720 10 bit	2.7

Macintosh

ATTO Firmware

The ATTO ExpressPCI Dual Channel Ultra3 is recommended. Firmware version 1.64 or later must be used to maximize the Ultra160 interface. This can be downloaded from www.attotech.com.

RAID Compatibility

Media Vault Mode Select	Apple Non-Striped Partition (Standard)	Apple Striped Partition (RAID 0)
RAID 0 (mode 0)		
OS X ATTO ExpressStripe	Okay	Okay
OS X Apple Disk Utility	Okay	Okay
RAID 3/2k (mode 1)		
OS X ATTO ExpressStripe	Not Compatible	Not Compatible
OS X Apple Disk Utility	Okay	Okay
RAID 3 (mode 2)		
OS X ATTO ExpressStripe	Okay	Okay
OS X Apple Disk Utility	Okay	Okay

Windows NT / 2000 / XP

RAID Compatibility

Media Vault Mode Select	Non-Striped Partition (Standard)	Striped Partition (RAID 0)
RAID 0 (mode 0)		
NT / Win2K / XP	Okay	Okay
RAID 3/2k (mode 1)		
NT	Okay	Okay
Win2K / XP	Basic Disk only, no Dynamic	Not Compatible
RAID 3 (mode 2)		
NT / Win2k / XP	Okay	Okay

MaximumGSList

NTFS – Enlarge Scatter Gather List value.

NTFS is used in Windows NT and Windows 2000 Operating Systems. Applying this NT registry change to the Scatter-Gather List when using the Adaptec controllers will enable maximum data throughput performance.

You may download the automated registry update from our web site, the file to download is maxsg.zip, in it there is a file called maxsg.reg. Extract and execute maxsg.reg will update the registry accordingly.

Or you may update the registry manually by following the steps below.

Run REGEDT32 to edit the system register.

Go to \HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\
If U160 Adaptec then continue to \adpu160m
If Ultra2 Adaptec then continue to \aic78u2
If non-Ultra2 Adaptec then continue to \aic78xx

Create a “Parameters” key (without quotations). Edit > New > Key and enter Parameters.
Go to \Parameters
Create a “Device” key (without quotations). Edit > New > Key and enter Devices.
In a multiple host adapters system. Use Device0, Device1, etc… to specify the specific adapter.
Go to \Device
Create a “MaximumSGList” value name (no quotations). Edit > DWORD value and enter MaximumSGList. Enter FF for Value data, make sure Hexadecimal is set.
Exit Regedit and reboot.

<end of User’s Guide>